

1           1. In an optical device having at least one movable element, a method of  
2           operating the optical device comprising the steps of:

3                 receiving an optical signal from an optical input aperture;

4                 diffracting the optical signal into one or more chromatically dispersed non-  
5                 zeroth-order components and a non-chromatically dispersed zeroth-  
6                 order component; and

7                 directing one of the non-zeroth-order components to an optical output;

8           CHARACTERIZED IN THAT:

9                 positional feedback information about the movable element is determined  
10                 from the zeroth-order optical signal.

1           2. The method according to claim 1 further comprising the step of:

2                 directing the zeroth-order component to a position detector.

1           3. The method according to claim 2 further comprising the step of:

2                 directing the optical signal to the movable element.

1           4. The method according to claim 3 wherein the optical-signal directing, the  
2           zeroth-order-component directing, and the non-zeroth-order-component  
3           directing is performed by a common optical element.

1           5. The method according to claim 4 wherein the common optical element is a  
2           lens.

1       6. The method according to claim 1 wherein the diffracting step is performed by  
2       the action of the movable element and that movable element is a diffraction  
3       grating.

1       7. The method according to claim 1 further comprising the step of:  
2       positioning the movable element based upon the positional feedback  
3       information.

1       8. The method according to claim 1 wherein the movable element is a mirror.

1       9. The method according to claim 1 wherein the optical input aperture comprises  
2       a plurality of input apertures.

1       10. The method according to claim 1 wherein the optical output comprises a  
2       tapered slit.

1       11. The method according to claim 1 further comprising the step of:  
2       chopping the non-zeroth order components such that desirable  
3       signal/noise characteristics are realized.

1       12. An optical device comprising:  
2       an input for receiving an optical signal;  
3       a diffractor, for diffracting the optical signal into a one or more chromatically  
4       dispersed non-zeroth-order components and a non-chromatically-  
5       dispersed zeroth-order component;  
6       a movable reflector, for selectively directing one of the non-zeroth order  
7       components to an output; and

8           a position detector; responsive to the zeroth-order component; for providing  
9           positional feedback information about the movable reflector.

1       13.The optical device according to claim 7 wherein the movable reflector is  
2       responsive to control signals determined from the positional feedback  
3       information.

1       14.The optical device according to claim 7 wherein the diffractor is a diffraction  
2       grating.

1       15. The optical device according to claim 7 wherein the diffractor and the  
2       movable reflector are the same optical element and that same optical element  
3       comprises a grating.

1       16.The optical device according to claim 8 further comprising an optical element  
2       for directing the input optical signal to the diffractor.

1       17.The optical device according to claim 8 further comprising an optical element  
2       for directing the input optical signal to the diffractor and a non-zeroth-order  
3       component to the output.

1       18.The optical device according to claim 12 further comprising an optical element  
2       for directing the zeroth-order component to the position detector.

1       19.The optical device according to claim 13 wherein the input optical signal  
2       director element, the non-zeroth-order directing element and the zeroth-order  
3       directing element are a common optical element.

1       20.The optical device according to claim 14 wherein the common optical element  
2       comprises a lens.

1       21.The optical device according to claim 12 wherein the input comprises one or  
2       more apertures.

1 22.The optical device according to claim 12 wherein the output comprises a  
2 tapered slit.

1 23.An optical device comprising:

2 means for inputting an optical signal;

3 means for diffracting the optical signal into one or more chromatically  
4 dispersed non-zeroth-order components and a non-chromatically  
5 dispersed zeroth-order component;

6 means for directing, one of the non-zeroth components to an output; and

7 means for determining, a position of the directing means from information  
8 derived from the zeroth-order component.

1 24.The optical device according to claim 16 further comprising a means for  
2 directing the zeroth-order component to the position determining means.

1 25.The optical device according to claim 17 wherein the zeroth-order component  
2 directing means and the non-zeroth order directing means are lenses.

1 26.The optical device according to claim 17 wherein the zeroth-order component  
2 directing means and the non-zeroth order directing means comprise a  
3 common lens.

1 27.The optical device according to claim 23 further comprising:

2 means for chopping the output directed components.